

# Compilation Procedures for SSURGO Data Bases

## Materials

The following materials are needed to perform soil map compilation for SSURGO:

### Base maps

If the soil survey has been published and the base maps for the publication are either 1:12,000 or 1:24,000 orthophotoquads, these are acceptable bases for SSURGO digitizing and should be used as the compilation document. Or, the soils portion of the publication base maps may be transferred from these bases to mylar overlays for scanning.

If the published base maps are neither of the above, the soil map information should be transferred to an acceptable base before digitizing. This will require obtaining an orthophotograph at either 1:12,000 or 1:24,000 scale.

If orthophotography is not available or not scheduled for delivery, its acquisition must be coordinated through the Soils Division. **To acquire orthophotography** contact Jim Ware, 202-720-1808.

In the event of delayed delivery of orthophotography for reasons beyond normal control such as repeated inclement weather during aerial photo flying season, the use of USGS topographic mylars is acceptable. Use of these bases for SSURGO is discouraged because information compiled to them will not match the digital orthophotography when it becomes available. Considerable adjustments to the SSURGO data may be needed to match to digital imagery. If the USGS topographic mylar base is the selected base, it must be purchased directly from USGS from their Mid-Continent Mapping Center in Rolla, Missouri. Obtaining enlargements or reductions of the orthophoto or topographic mylars to fit publication scale that deviate from 1:12,000 or 1:24,000 is not acceptable. The camera processes to produce them may affect the accuracy of the base maps. Whichever base map is used, it must be side punch registered with an odd hole punch. Side punch registering is recommended over top or bottom registering because it reduces the amount of shifting that may occur on the outer edges of the materials.

### Index to base maps

Line index of base maps, either of the following: orthophotoquads, orthophoto-quarterquads, or USGS topographic quadrangles showing the location of each in the survey area.

### Film positives of soil source information

Scaled film positives at 1:12,000 or 1:24,000 of the original compilation base maps or field sheets must be obtained if at scales other than these. (Available from National Cartography and Geospatial Center on a reimbursable basis.)

### Reference maps

Reference maps include the USGS topographic quadrangles and a county highway map.

### Final classification and correlation document

If a final classification and correlation document is not prepared, the certification of progressive correlation is used. The soil symbol conversion legend may not contain the final publication symbols, and changing some soil symbols may be necessary when the final correlation is completed. Also included with the final classification and correlation document are *Instructions for Map Compilation, Map Finishing, and Digitizing*, which may give special instructions.

### Adjacent published soil surveys

Adjacent published soil surveys, or copies of the completed field sheets of adjacent surveys or the SSURGO data of such, plotted at the same scale as the project should be obtained. If mapping is in progress in adjacent soil surveys, the completed field sheets are needed to insure a correct match between soil survey areas. Joining discrepancies must be resolved and approved by the state soil scientist before completing the compilation process. Usually, the compilation is adjusted to fit the previously published soil surveys.

## Drafting and miscellaneous tools

The following drafting and miscellaneous tools are suggested:

- rapidograph pens
- colored pencils
- erasers for film
- eraser shield
- 7-pin registration bar
- a magnifying glass
- a straight edge
- a draftsman's brush
- paper towels
- a symbol template
- a light table large enough to accommodate the largest compilation sheet
- masking tape
- papers weights

See appendix A for a detailed supply list and recommended sources.

## Edit material

Edit overlay material such as matte film acetate is usually provided along with the compilation photo-base materials. The acetate is for color checking and editing purposes only. It should never be used as a base for digitizing.

## Prepunched stable base mylar

One odd number hole, prepunched stable base (minimum 4 mil) 24- by 30-inch single matte mylar for each full quadrangle map sheet.

## Labels

Large white labels for labeling compilation mylar overlays for use in digitizing.

## Electric pencil sharpener

An electric pencil sharpener is helpful in keeping leads sharp so that consistent line widths are drawn.

## Light table

A light table large enough to accommodate the largest compilation sheet.

## Information to be compiled

Only soils features are compiled for SSURGO. The SSURGO soil labels must be the same as the published or approved soil survey labels. The compiler is responsible for obtaining a classification and correlation document for the soil survey area before compilation begins. If this document is not available because the compilation is being performed while the soil survey is still progressing then, the compiler is responsible for obtaining the certification of progressive correlation.

## Compilation sequence

The sequence in which soil information will be compiled on each map is as follows:

- corner ticks and neatlines
- soil area features
- special and ad hoc features
- soil labels

Always compile from the top of the compilation base map down and from left to right for right handed compilers or, from right to left for left handed compilers will reduce smudging or smearing of the pencil work.

## Color scheme

The following color scheme is suggested for compiling soil surveys that will be scanned:

## On overlay

corner ticks = **black**  
county boundary ticks = **black**  
neatlines = **yellow**  
soil lines = **black**  
soil labels = **red**  
special features = **purple**  
ad hocs = **purple**  
special features labels = **red**  
ad hocs labels = **red**

# Procedures

The following procedures are recommended to perform compilation for SSURGO:

1. **Verify that all materials are available.**
  2. **Read the classification and correlation document.**

This will provide the compiler with instructions for compiling and will identify what is to be digitized.
  3. **Make copies of the NRCS-SOI-37A and the conversion legend and place these somewhere for convenient reference.**

**Note:** To increase legibility and reduce conversion errors, highlight every other line of the conversion legend and the approved NRCS-SOI-37A SSURGO symbols.
  4. **Obtain the recommended colored pencils for the features to be compiled.**
  5. **Prepare the soils compilation overlay.**

The soils information needs to be transferred to a mylar overlay to be scanned. To prepare this overlay complete the following:

    - Obtain the photobase sheet and secure it to the registration bar.
    - Obtain a single matte stable base mylar and secure it to the registration bar on top of the photobase.
    - Smooth the overlay with a draftsman's brush to remove air gaps. Begin on the punched side and work in the opposite direction.
    - Transfer the corner quad ticks from the photobase to the overlay. Use a rapidograph pen (00) or the same color lead as the soil lines and, with a straight edge, draw the ticks as solid crosses about 0.20 inch in length. Do not use the dashed corner ticks as they represent a different datum.
    - Use a straight edge to draw the neatlines in yellow.
  6. **Place the selected source sheet on the light table and secure it with masking tape.**
  7. **Prepare soil features for compilation.**

If the soils lines on the copies of the field sheets are obscure in dark areas, highlight these lines with a colored pencil to increase their visibility before beginning the transfer. Highlight special features (spot symbols) with a yellow highlighter to ensure that all approved features are compiled.
  8. **Match compilation base to source sheet.**

Place the corresponding compilation base map directly on top of the source sheet so that their images are superimposed. Adjust the compilation base until an exact match between the images is achieved. Use such features as roads, streams, or field boundaries to align the two images.
  9. **Secure the compilation base.**

Once matched, secure the compilation base to the light table with masking tape. This is practical when a large area is well matched. For areas requiring constant shifting to achieve an exact match, using paper weights is more practical.
  10. **Protect the compilation base.**

Before beginning the transfer of the soil lines, place a paper towel or similar material over the area of the compilation base not being worked on. This prevents hand sweat and oils from adhering to the compilation overlay which, may cause smudging of the line work or prevent the surface from retaining the lead. **Note:** Cotton gloves may be used instead of paper towels.
  11. **Transfer soil information.**

Before transferring a line, check the adjacent soil map unit symbols and refer to the conversion legend to determine if the map units are to be combined. If the soil map unit is not combined, transfer the soil line. If the soil map units are to be combined, do not transfer the common soil line, but adjust the boundary line to eliminate sharp or abrupt shapes.
- Make a label with the following information:
    - Soil Survey Area Name, STSSAID
    - Sheet Number
    - Quadrangle Name
    - Scale
    - Projection, Datum, UTM Zone
    - Corner Coordinate Values

Place the soil line such that it will not coincide with any other visible features. This may require moving it slightly from its position on the field sheet.

Ensure that all soil lines are smooth, have consistent line weight, and have no overshoots or breaks in the line.

When matching adjacent sheets, ensure that the soil lines are an exact match. Align the two images first, then adjust the soil lines on both sheets, if necessary, to achieve the match. Extend soil lines 1/4 inch beyond the neatline.

Place the county boundary in black on the soils overlay. If the county boundary is a straight line it can be compiled with tick marks. Otherwise, draw it as a continuous black line.

Occasionally, map neatlines do not match adjacent maps exactly. This is more noticeable on quarter and full quadrangle formats. To ensure precise edgematching, align to adjacent maps such that the corner ticks and either the UTM meter ticks or the 2.5-minute ticks are exactly aligned. Then transfer the map information between these ticks. Realign the two maps to the next set of ticks and then transfer the map information. Repeat this process along each neatline.

- If the units are large and meandering, add additional labels.
- Adjust the compilation base as often as necessary to ensure correct alignment with the field sheet.
- If erasing any pencil work is necessary, use a high quality mylar eraser and erase all unwanted lines completely. **Note:** Electric or clutch erasers are easier to use in congested areas than block erasers because their surface area is smaller allowing the removal of only the desired features.

#### 12. **Transfer special features.**

While compiling the soil lines and converting the field symbols to publication labels, also transfer the approved special features. Note: Use only the symbols highlighted on the NRCS-SOI-37A. Modifying these or creating new ones is not acceptable. (Appendix E)

**For Point Features:** Place an “X” directly over the location of a point special feature, such as a wet spot, in purple pencil and then print the three letter-code such as “WET” directly above the “X” in red pencil.

**For Linear Features:** Trace the special feature in purple and place the appropriate three letter code over the feature.

#### 13. **Register the compilation base and edit overlay.**

Remove the source sheet and the compilation base from the light table. Place the compilation base in the registration bar. Obtain matte film acetate and place it, matte side up, over the registered compilation base.

Label the acetate with the photobase sheet number or the USGS topographic quadrangle name.

#### 14. **Edit the compilation base.**

Begin editing the completed compilation base using the edit checklist identified in appendix B.

**Note:** Compilers should not edit their own compilation. To have someone else verify the work is more efficient. Identify edit calls on the acetate using the editorial symbol legend in appendix C. The edit overlay provides useful information that can assist the compiler in identifying common reoccurring compilation errors.

#### 15. **Correct the edit calls.**

These corrections should be made by the person who performed the compilation. The correction process can be a learning tool for improving the quality of future compilations. See appendix D for common errors.





#### 16. **Correct field sheet.**

If the edit calls identify errors that were originally on the field sheets, make the corrections on the field sheets as well.









#### 17. **Forward compilation materials to Major Land Resource Area office for review and certification.**







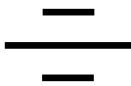




# Appendix E: Special Symbols for Soil Survey and SSURGO

## Linear Features

Feature	Label	Name	Description
	ESB	Escarpment, bedrock	A relatively continuous and steep slope or cliff produced by erosion or faulting breaking the general continuity of more gently sloping land surfaces. Exposed material is hard or softbedrock.
	ESO	Escarpment, other	A relatively continuous and steep slope or cliff generally produced by erosion, but can be produced by faulting breaking the continuity of more gently sloping land surfaces. Exposed nonbedrock material is nonsoil or very shallow, poorly developed soil.
	SLP	Short, steep slope	Narrow soil area that has slopes that are at least 2 slope classes steeper than the slope class of the surrounding map unit.
	GUL	Gully	Narrow soil area that has slopes that are at least 2 slope classes steeper than the slope class of the surrounding map unit.

## Point Features

Feature	Label	Name	Description
	DEP	Depression, closed	A shallow, saucer-shaped area slightly lower on the landscape than the surrounding area, but without a natural outlet for surface drainage. Typically 1 to 3 acres.
	SNK	Sinkhole	A closed depression formed either by solution of the surficial rock, or by collapse of underlying caves. Complexes of sinkholes in carbonate-rock terrain are the main components of karst topography. Typically 1 to 3 acres.
	BPI	Borrow Pit	An open excavation from which soil and underlying material have been removed, usually for road construction. Typically 1 to 3 acres.
	GPI	Gravel pit	An open excavation from which soil and underlying material have been removed, and used without crushing, as a source of sand or gravel. Typically 1 to 3 acres.
	MPI	Mine or quarry	An open excavation from which soil and underlying material is removed exposing the bedrock. Also used to denote surface openings to underground mines. Typically 1 to 3 acres.
	LDF	Landfill	An area of accumulated waste products of human habitation which can be above or below natural ground level. Typically 1 to 3 acres.
	MIS	Miscellaneous water	Small manmade water area used for industrial, sanitary, or mining applications that contains water most of the year. Typically 1 to 2 acres.
	WAT	Perennial water	Small natural or manmade lake, pond, or pit that contains water most of the year. Typically 1 to 3 acres.

Feature	Label	Name	Description
	<b>BLO</b>	Blowout	A small saucer, cup, or trough-shaped hollow or depression formed by wind erosion, on a pre-existing sand deposit. Typically 1 to 3 acres.
	<b>CLA</b>	Clay spot	Surface texture is silty clay or clay. Typically 1 to 3 acres.
	<b>GRA</b>	Gravelly spot	Surface layer has more than 35 percent, by volume, of rock fragments that are mostly less than 3 inches in diameter. Typically 1 to 3 acres.
	<b>MAR</b>	Marsh or swamp	A water saturated, very poorly drained area, intermittently or permanently water-covered. Marsh areas are dominantly covered by sedges, cattails, and rushes. Swamps are dominantly covered by trees or shrubs. Not used in map units where poorly drained or very poorly drained soils are the named components. Typically 1 to 3 acres.
	<b>ROC</b>	Rock outcrop	An exposure of bedrock at the surface of the earth. Not used where the named soils of the surrounding map unit are shallow over bedrock. Typically 1 to 3 acres.
	<b>SAN</b>	Sandy spot	Surface layer with sand content greater than 75 percent in areas where the surface layer of the named soils of the surrounding map unit have less than about 25 percent sand. Typically 1 to 3 acres.
	<b>ERO</b>	Severely eroded spot	An area where on the average 75 percent or more of the original surface layer has been lost from accelerated erosion. Typically 1 to 3 acres.
	<b>SPO</b>	Spoil area	Piles of earthy materials either smoothed or uneven resulting from human activity. Typically 1 to 3 acres.
	<b>STN</b>	Stony spot	An area with 0.01 to 3 percent of the surface covered with rock fragments that are greater than 10 inches in diameter. Typically 1 to 3 acres.
	<b>STV</b>	Very stony spot	An area with more than 3 percent of the surface covered rock fragments that are greater than 10 inches in diameter. Typically 1 to 3 acres.
	<b>WET</b>	Wet spot	Somewhat poorly drained to very poorly drained area that is at least 2 drainage classes wetter than the named soils in the surrounding map unit. Typically 1 to 3 acres.